

**LISTING OF THE CLAIMS**

We claim:

1. (Original) A method comprising generating a Concrete Model, said Concrete Model describing a structure of resources implementable over a computing utility infrastructure, and satisfying a set of service requirements, said step of generating comprising the steps of:

obtaining a Service Environment Model of a service environment, said Service Environment Model describing a set of requirements on a new desired state of said service environment;

getting an Infrastructure Model describing both resources and an organization of the resources in the computing utility infrastructure, said Infrastructure Model is encapsulated in a knowledge subsystem; and

forming the Concrete Model describing a resource structure such that said Concrete Model refines the Service Environment Model and is mappable to said knowledge subsystem .

2. (Currently amended) A method as recited in claim 1, wherein the step of ~~obtaining a~~ obtaining the Service Environment Model of the service environment includes receiving a description of a set of requirements on a new desired state of said service environment.

3. (Currently amended) A method as recited in claim 1, wherein said Service Environment Model step of describing ~~description~~ is independent of the computing utility infrastructure;

4. (Original) A method as recited in claim 1, wherein said service environment is an entity taken from a group of entities consisting of: a Web site, an on-line gaming service, a scientific computation service, an e-business service, a computing service, and any combination of these.

1 5. (Currently amended) ~~An~~A method as recited in claim 1, implemented as an article of  
2 manufacture comprising a computer usable medium having computer readable program code  
3 means embodied therein for causing generation of the a-Concrete Model, the computer readable  
4 program code means in said article of manufacture comprising ~~computer readable program code~~  
5 ~~means~~ for causing a computer to effect the steps of claim 1.

6 6. (Currently amended) A method as recited in claim 1, wherein the step of getting an  
7 Infrastructure Model includes an action taken from a group of actions consisting of: querying at  
8 least one knowledge subsystem entity; ~~querying Resource Managers; querying Resource Instance~~  
9 ~~Services; querying Resource Managers; querying Resource Instance Services;~~ querying a best  
10 practices catalog; obtaining knowledge of available resource types; obtaining knowledge of  
11 resources constraints; obtaining knowledge of resource capabilities; obtaining knowledge of  
12 infrastructure constraints; obtaining knowledge of infrastructure capabilities; obtaining knowledge  
13 of infrastructure best practices patterns; and any combination of these actions.

14 7. (Currently amended) A method as recited in claim 1, wherein the step of forming a Concrete  
15 Model includes:

16 at least one refinement step comprised of selecting a node and replacing said node with a  
17 sub graph structure to obtain an intermediary model which is an input to a next refinement step;  
18 and

19 repeating the step of selecting and replacing until a resulting intermediary model is  
20 mappable to said knowledge subsystem.

21 8. (Currently amended) A method as recited in claim 7, wherein said step of replacing comprises  
22 a limitation taken from a group of limitations consisting of: querying a best practices catalog;  
23 generating sub graph patterns dynamically; employing graph matching techniques to obtain said  
24 sub-graph structure; employing graph merging techniques to obtain said sub-graph structure; or  
25 any combination of these limitations.

1 9. (Currently amended) A method as recited in claim 1, implemented as a program storage device  
2 readable by computer machine, tangibly embodying a program of instructions executable by the  
3 computer machine to perform method steps for generating the a Concrete Model, said method  
4 steps comprising the steps of claim 1.

5 10. (Original) A method as recited in claim 1, further comprising using said generating said  
6 Concrete Model to enforce a policy based service provider's best practices in implementation of  
7 Service Environments in the computing utility infrastructure.

8 11. (Original) A method as recited in claim 10, wherein the best practices are encoded as patterns  
9 in a best practices catalog and used in the step of forming said Concrete Model.

10 12. (Currently amended) A method as recited in claim 1, further comprising employing said  
11 Concrete Model to generate provisioning actions,

12 said provisioning actions, when executed, ~~create~~ creating a resource structure that matches the  
13 description in the Concrete ~~Model~~, Model, and

14 said resource structure ~~satisfies~~ satisfying said set of requirements on the new desired state of said  
15 service environment.

16 13. (Original) A method as recited in claim 12, further comprising employing said provisioning to  
17 enforce a policy based service provider's best practices in implementation of service environments  
18 in the computing utility infrastructure.

19 14. (Original) A method as recited in claim 13, wherein the best practices are encoded as patterns  
20 in a best practices catalog and used in the step of forming the Concrete Model.

21 15. (Original) A method as recited in claim 12, wherein step of provisioning includes a task taken  
22 from a group of tasks consisting of: creating a new service environment, changing the

1 combination of resources allocated to a service environment, changing the configuration of  
2 resources allocated to a service environment, or destroying a service environment, or any  
3 combination of the above.

4 16. (Original) A method as recited in claim 15, wherein changing the configuration of resources  
5 allocated to a service environment include changing the local state of a resource or changing the  
6 way the resource is configured to work with other resources.

7 17. (Currently amended) A method as recited in claim 1, wherein the method ~~can be~~ is used to  
8 regenerate provisioning instructions whenever at least one of the following occurs: infrastructure  
9 characteristics ~~change, change, and or~~ requirements of a service change.

10 18. (Currently amended) A method as recited in claim 17, wherein the infrastructure  
11 characteristics include a characteristic taken from a group of characteristics consisting of: ~~types of~~  
12 ~~resources in the infrastructure, capabilities of said resources, configuration of said resources,~~  
13 ~~constraints on configuration of said resources, best practices patterns as defined in the best~~  
14 ~~practices catalog, types of resources in the infrastructure; capabilities of said resources;~~  
15 configuration of said resources; constraints on configuration of said resources; best practices  
16 patterns as defined in the best practices catalog; or and any combination of the above.

17 19. (Original) A method as recited in claim 1, further comprising employing said Concrete Model  
18 to generate a Resource Manager for a composite resource.

19 20. (Currently amended) A method as recited in claim 19, wherein said Resource Manager  
20 provides a set of resource manager methods taken from a group of resource manager methods  
21 consisting of: ~~creating composite resources based on a Concrete Model, changing composite~~  
22 ~~resources based on a Concrete Model, destroying composite resources based on a Concrete~~  
23 ~~Model, creating composite resources based on a Concrete Model; changing composite resources~~  
24 based on a Concrete Model; destroying composite resources based on a Concrete Model; and or  
25 any combination of these methods.

21. (Currently amended) An apparatus comprising means for generating a Concrete Model, said Concrete Model describing a structure of resources implementable over a computing utility infrastructure, and satisfying a set of service requirements, said ~~step of~~ means for generating comprising the steps of:

means for obtaining a Service Environment Model of a service environment, said Service Environment Model describing a new desired state of said service environment;

means for getting an Infrastructure Model describing both resources and an organization of the resources in the computing utility infrastructure, said Infrastructure Model is encapsulated in a knowledge subsystem and

means for forming the Concrete Model describing a resource structure such that said Concrete Model refines the Service Environment Model and is mappable to said knowledge subsystem .

22. (Original) An apparatus as recited in claim 21, further comprising means for employing said Concrete Model to generate provisioning actions, said provisioning actions, when executed, create a resource structure that matches the description in the Concrete Model, said resource structure satisfies said new desired state of said service environment.

23. (Currently amended) ~~A~~An apparatus as recited in claim 21, implemented as a computer program product comprising a computer usable medium having computer readable program code means embodied therein for causing generation the ~~a~~-Concrete Model, the computer readable program code means in said computer program product comprising ~~computer readable program~~ code ~~means~~ for causing a computer to effect the functions of claim 21.

24. (Original) An apparatus as recited in claim 21, further comprising means for employing said Concrete Model to generate a Resource Manager for a composite resource.

- 1 25. (Currently amended) A method as recited in claim 1, where the step of generating a Concrete
- 2 Model is performed by a user taken from a group of users consisting of: ~~a service provider, a~~
- 3 ~~customer of a service provider, a company owning an IT infrastructure, a service provider, a~~
- 4 customer of a service provider; a company owning an IT infrastructure; and a utility provider.